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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/802,763

03/18/2004

Ryosuke Yoshihiro

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EXAMINER

BERTHEAUD, PETER JOHN

ART UNIT

PAPER NUMBER

3746

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/27/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/802,763

Applicant(s)

YOSHIHIRO ET AL.

Examiner

Peter J. Bertheaud

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>3/18/2004, 6/27/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the subject matter of claim 4, including the valve member being upstream of the valve seat and the configuration of fluid flow through the ports must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: On page 1, line 23; the phrase "a control valve therefor opens and closes a communication passage" is believed to be a typographical error.

Appropriate correction is required.

3. The disclosure is objected to because of the following informalities: On page 2, line 23; the phrase "has a set load thereof set based on an average" is believed to be a typographical error.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 5, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirota 2003/0024257.

Hirota (Fig. 2) discloses a control valve for variable capacity compressor for controlling a difference between discharge pressure and suction pressure in the variable displacement compressor such that the difference becomes equal to constant differential pressure set by an electromagnetic solenoid 45 which is duty ratio controlled, characterized in that a valve section 11 that carries out opening and closing control of a

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passage between a first port 25 into which refrigerant is introduced and a second port 30 from which the refrigerant is guided out is formed by a spool valve 26. Hirota further discloses that the valve section includes a valve seat 27 formed in a passage between the first port 25 and the second port 30, a spool valve element 26 disposed such that it can be moved into and away from a valve hole in an upstream side space or a downstream side space adjacent to the valve seat 27, a spring 44 for urging the spool valve element in a valve-opening direction, and a pressure-sensing shaft 32 for transmitting pressure introduced thereto from a third port 35, to the spool valve element 26. Hirota also discloses that a predetermined clearance is provided between an end of the spool valve element 26 moved into the valve hole, and an inner wall surface of the valve hole, so as to cause the clearance to function as an orifice (see Fig. 2). Hirota further discloses that the spool valve element 26 and the pressure-sensing shaft are integrally formed with each other.

6. Claims 8 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirota US 2003/0019226.

Hirota (Figs. 4 and 5) teaches a control valve for a variable displacement compressor, for controlling a difference between discharge pressure and suction pressure in the variable displacement compressor such that the difference becomes equal to constant differential pressure set by an electromagnetic solenoid 42 which is: duty ratio controlled, characterized by comprising: a first valve section 61 that carries out opening and closing control of a passage between a first port 87 into which refrigerant from a discharge chamber is introduced and a second port 89 from which the

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refrigerant having a flow rate thereof controlled is guided out to a crankcase; and a second valve section 62 that carries out opening and closing control of a passage between a third port 90 into which the refrigerant is introduced from the crankcase and a fourth port 91 from which the refrigerant having a flow rate thereof controlled is guided out to a suction chamber, in a manner interlocked with operation of the first valve section, and wherein at least one of the first valve section and the second valve section is formed by a spool valve 61 whose valve element can be moved into and away from a valve hole of a valve seat 70 associated therewith. Hirota further discloses that a predetermined clearance is provided between an end of the valve element of the spool valve 61 moved into the valve hole, and an inner wall surface of the valve hole, so as to cause the clearance to function as an orifice (see Figs. 4 and 5).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota US 2003/0024257 in view of Taguchi 5,165,863 and in further view of Kume 6,439,858.

Hirota discloses the invention as discussed above. However, Hirota does not teach the following claimed limitations taught by Taguchi.

Taguchi teaches a compressor with a variable capacity control mechanism comprising a valve element 480, a solenoid 430, a spring 491 for urging the valve element in a valve-opening direction and first 492, second 424, and third 424 ports. Taguchi further teaches that the valve element 480 is disposed on the downstream side of the valve seat 489.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the control valve of Hirota, by placing the valve element on the downstream side of the valve seat, in order to configure the spring to urge the valve member downwardly in order for it to open (Taguchi, col. 8, lines 19-21).

Hirota in view of Taguchi discloses the invention as discussed above. However, Hirota in view of Taguchi does not teach the following claimed limitations taught by Kume.

Kume teaches a control valve for variable capacity compressors comprising a valve element 17, a solenoid 43, a spring 42 for urging the valve element in a valve-opening direction and first 12, second 13, and third 51 ports. Kume further teaches that the discharge pressure in the variable displacement compressor is being introduced into the first port 12, pressure in a crankcase of the variable displacement compressor being guided out from the second port 13, and the suction pressure in the variable displacement compressor being introduced into the third port 51.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the control valve of Hirota in view of

Taguchi, by arranging the ports to have this particular fluid flow configuration in order to decrease the flowrate of the discharge fluid, thereby lowering the pressure of the crankcase and hence, increasing the discharge capacity of the variable capacity compressor (Kume, col. 6, lines 23-28).

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota US 2003/0024257 in view of Ota 6,354,811.

Hirota discloses the invention as discussed above. However, Hirota does not teach the following claimed limitations taught by Ota.

Ota (Fig. 2) teaches a control valve for variable displacement compressors comprising a valve element 61, a spring 75 for urging the valve element in a valve-opening direction and first 57, second 58, and third 67 ports. Ota further teaches the valve element 61 is disposed on the upstream side of the valve seat, pressure in a crankcase of the variable displacement compressor being introduced into the first port 57, the suction pressure in the variable displacement compressor being guided out from the second port 58, and the discharge pressure in the variable displacement compressor being introduced into the third port 67.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the control valve of Hirota, by arranging the ports to have this particular fluid flow configuration in order to quickly change the crank pressure (Ota, col. 3, lines 12-14).

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota US 2003/0024257.

Hirota discloses the claimed invention except for the pressure-sensing shaft 32 and a drive shaft 39 being integral. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make these two parts integral, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (see MPEP 2144.04 V. B - Making Integral).

11. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota US 2003/0019226.

Hirota discloses the claimed invention except for the valve element 61 of the first valve section, the valve element 62 of the second valve section, and a drive shaft 76 being integral. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make these three parts integral, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (see MPEP 2144.04 V. B - Making Integral).

Conclusion

12. The prior art made of record, noted in the attached form 892, and not relied upon is considered pertinent to applicant's disclosure.

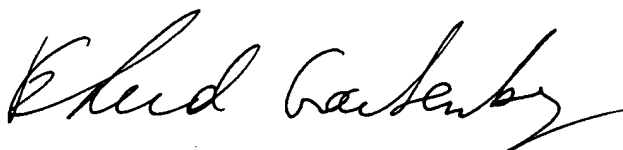
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J. Bertheaud whose telephone number is (571) 272-3476. The examiner can normally be reached on M-F 9am - 5pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg can be reached on (571) 272-4828. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


PJB 12/14/07


EHUD GARTENBERG
SUPERVISORY PATENT EXAMINER